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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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12/21/2004

David Lior

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10/30/2007

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EXAMINER

KIM, TAE JUN

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

10/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,767

Applicant(s)

LIOR, DAVID

Examiner

Ted Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/22/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 10-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>01/24/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I (claims 1-9) in the reply filed on 10/22/2007 is acknowledged.
2. Claims 10-23 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/22/2007.

Claim Objections

3. Claims 5 and 7 are objected to because of the following informalities: claims 5 and 7 each begin with paragraph letter "c" which is already used in claim 1. This "c" should be replaced by -d - or deleted.. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Guirguis (4,897,995). Guirguis teach an engine, comprising: a. a rotating assembly including a primary compressor 4a, an inner casing (bottom portion of 5, below the cavity 9) and a compressor-driving nozzle wheel 6; b. an outer casing 2, 5c, enclosing said rotating assembly; and c. a substantially annular flame holder (the bluff wall of 5 along

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with the cavity 9) encircling said inner casing within said combustion chamber; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing 2, 5c does not rotate with said rotating assembly; wherein said at least one combustion chamber is substantially a single annular combustion chamber; wherein said rotating assembly includes a single said flame holder; wherein said flame holder is included in said rotating assembly; a rotating diffuser (right end portion of 4b) between said primary compressor and said combustion chamber; said rotating diffuser includes extensions to terminal blades of said primary compressor 4a; wherein said rotating assembly further includes at least one fuel injector 17, 18.

6. Claims 1-5, 7, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Levesque (4,368,619). Levesque teaches an engine, comprising: a. a rotating assembly including a primary compressor 28, an inner casing 56 and a compressor-driving nozzle wheel 113; b. an outer casing 10, enclosing said rotating assembly; and c. a substantially annular flame holder (annular wall 60 or annular wall 40a or alternately vane 88 and annular wall 82 form an annular flame holder) encircling said inner casing 56 within said combustion chamber; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing 10 does not rotate with said rotating assembly; wherein said at least one combustion chamber is substantially a single annular combustion chamber (either one of the two combustion

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chambers can be on the substantially single annular combustion chamber); wherein said rotating assembly includes a single said flame holder (any of the aforementioned 60, 40a, or 82); wherein said flame holder is included in said rotating assembly; a substantially tubular element 58 surrounding said inner casing, wherein a leading edge of said tubular element is positioned aft of said primary compressor 28 so as to divide airflow from said primary compressor into an outer airflow and an inner airflow, wherein said outer airflow is between said tubular element 58 and said outer casing 10 and wherein said inner airflow is between said tubular element 58 and said inner casing 56; a rotating diffuser between said primary compressor and said combustion chamber (e.g. between 40 and 42); wherein said rotating assembly further includes at least one fuel injector 122.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karlby et al (2,784,551) in view of either Spadaccini (4,226,087) or Pillsbury (5,927,076). Karlby et al teach an engine, comprising: a. a rotating assembly including a primary compressor 59, an inner casing 49 and a compressor-driving nozzle wheel 75; b. an outer casing 11, enclosing said rotating assembly; and c. an array of flame holder 71

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encircling said inner casing within said combustion chamber; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing 11 does not rotate with said rotating assembly; wherein said at least one combustion chamber 61 is substantially a single annular combustion chamber; wherein said rotating assembly further includes at least one fuel injector 57. Karlby et al teach the flame holder can be any suitable construction (col. 6, lines 72+) and that the advantage of the flameholders is to increase the capacity of the combustion chamber and reduce the size of the combustion chamber (col. 4, lines 13-24). Karlby et al do not specifically state the flame holder is an annular flame holder. Spadaccini teach an annular flame holder 16 for a combustion chamber of a gas turbine which serves to stabilize the flame and sustain combustion without continuous ignition (col. 2, lines 15+) and low flashback potential and low pressure loss characteristics (col. 1, lines 40-44). Pillsbury teaches an annular flame holder 24 in a combustor for a gas turbine engine with minimum acoustic disturbance, low overall pressure losses and high operating efficiencies (see abstract). It would have been obvious to one of ordinary skill in the art to employ an annular flame holder, as taught by either Spadaccini or Pillsbury, as consistent with the teaching of using any suitable construction of Karlby et al, which allow stabilizing the flame and sustaining combustion without continuous ignition (col. 2, lines 15+) and/or low flashback potential and/or low pressure loss characteristics and/or minimum acoustic disturbances and/or high operating efficiencies.

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9. Claims 1-5, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levesque (4,368,619), as applied above, and further in view of Karlby et al (2,784,551) and either Spadaccini (4,226,087) or Pillsbury (5,927,076). Levesque teaches various aspects of the claimed invention and discloses annular walls that inherently serve as flameholders. In order to obviate any doubt, Karlby et al is applied as a teaching reference which specifically teaches in these rotating combustor arrangements a rotating flame holder of any suitable construction (col. 6, lines 72+) results in increasing the capacity of the combustion chamber and reducing the size of the combustion chamber (col. 4, lines 13-24). Karlby et al do not specifically state the flame holder is an annular flame holder. Spadaccini teach an annular flame holder 16 for a combustion chamber of a gas turbine which serves to stabilize the flame and sustain combustion without continuous ignition (col. 2, lines 15+) and low flashback potential and low pressure loss characteristics (col. 1, lines 40-44). Pillsbury teaches an annular flame holder 24 in a combustor for a gas turbine engine with minimum acoustic disturbance, low overall pressure losses and high operating efficiencies (see abstract). It would have been obvious to one of ordinary skill in the art to employ an annular flame holder, as taught by either Spadaccini or Pillsbury, in the rotating combustion chamber of Levesque, to enable increasing the capacity of the combustion chamber and reducing the size of the combustion chamber with further benefits including stabilizing the flame and sustaining combustion without continuous ignition and/or low flashback potential and/or low

pressure loss characteristics and/or minimum acoustic disturbances and/or high operating efficiencies.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the Levesque rejections, applied above, and further in view of Guirguis (4,897,995).

Levesque or the Levesque combination above, teach various aspects of the claimed invention including a rotating diffuser but do not teach the rotating diffuser includes extensions to terminal blades of said primary compressor. Guirguis teach a rotating diffuser (downstream end of the compressor blades 4a) which includes extensions to terminal blades of said primary compressor 4a. It would have been obvious to one of ordinary skill in the art to employ the rotating diffuser as an extension of the compressor blades, as an obvious matter of using an equivalent arrangement in the art to cause rotation of the diffuser.

11. Claims 1-5, 7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mortimer (2,793,496) in view of Karlby et al (2,784,551) and either Spadaccini (4,226,087) or Pillsbury (5,927,076). Mortimer teaches an engine, comprising: a. a rotating assembly including a primary compressor B', an inner casing G and a compressor-driving nozzle wheel E, E'; b. an outer casing C³, enclosing said rotating assembly; so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing C³ does not rotate with said rotating assembly; wherein said at least one combustion chamber is substantially a single annular

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combustion chamber; a substantially tubular element O surrounding said inner casing G, wherein a leading edge of said tubular element is positioned aft of said primary compressor B' so as to divide airflow from said primary compressor into an outer airflow and an inner airflow, wherein said outer airflow is between said tubular element O and said outer casing C³ and wherein said inner airflow is between said tubular element O and said inner casing G; a rotating diffuser (upstream of O³ note that the inner wall G rotates and hence constitutes a rotating diffuser) between said primary compressor and said combustion chamber. Mortimer do not teach a substantially annular flame holder encircling said inner casing within said combustion chamber. Karlby et al is applied as a teaching reference which specifically teaches in the flame holder can be of any suitable construction (col. 6, lines 72+) and results in increasing the capacity of the combustion chamber and reducing the size of the combustion chamber (col. 4, lines 13-24). Karlby et al do not specifically state the flame holder is an annular flame holder. Spadaccini teach an annular flame holder 16 for a combustion chamber of a gas turbine which serves to stabilize the flame and sustain combustion without continuous ignition (col. 2, lines 15+) and low flashback potential and low pressure loss characteristics (col. 1, lines 40-44). Pillsbury teaches an annular flame holder 24 in a combustor for a gas turbine engine with minimum acoustic disturbance, low overall pressure losses and high operating efficiencies (see abstract). It would have been obvious to one of ordinary skill in the art to employ an annular flame holder, as taught by either Spadaccini or Pillsbury, in the rotating combustion chamber of Mortimer, to enable increasing the capacity of the

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combustion chamber and reducing the size of the combustion chamber with further benefits including stabilizing the flame and sustaining combustion without continuous ignition and/or low flashback potential and/or low pressure loss characteristics and/or minimum acoustic disturbances and/or high operating efficiencies.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mortimer (2,793,496) in view of Karlby et al (2,784,551) and either Spadaccini (4,226,087) or Pillsbury (5,927,076), as applied claim above, and further in view of Danis et al (6,474,070). Mortimer teaches various aspects of the claimed invention including the substantially tubular element O, but does not teach using perforations in the tubular element. However, using perforations that location of the combustor chamber is well known in the art, as evidenced by Danis et al who uses perforations 54 to enhance the combustion process or perforations 56 to enhance the cooling of the combustor liner or perforations 58 to control the temperature profiler at the combustor outlet (col. 5, lines 23-44). It would have been obvious to one of ordinary skill in the art to employ perforations in the tubular element of Mortimer, in order to enhance the combustion process and/or to enhance the cooling of the combustor liner and/or to control the temperature profiler at the combustor outlet.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

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The fax number for the organization where this application is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer, can be reached at 571-272-7118. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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